**pH Lab**

**Materials**

* Data log
* Computer
* pH sensor
* Various liquids and household cleaners
* Three 100ml beakers
* A 400ml for the cooler water
* Pen and paper to make observations

**Method**

Before starting the experiment make sure that a table has been made including each liquid that will be tested with two additional columns one for the predicted pH and one for the actual pH. Also make sure to write your pH predictions before testing any of the liquids.

1. Connect the data log and pH sensor to a laptop/computer
2. Fill the 400ml beaker with roughly 200ml of cooler water (filtered water taken from the water cooler) then place the sensor in it. Click on “collect” and let the data log run for 30 seconds.
3. Stop the data log and find the average pH and either write it down or type it into a table.
4. Fill the three 100ml beakers each with 40ml a different solution and place the pH sensor in one of them, click “collect” and let it run for 30 seconds then record the average
5. Repeat this with each of the 3 beakers, making sure to rinse the pH sensor in the cooler water between each reading
6. After testing those liquids, empty, rinse and dry the beakers and choose another 3 different liquids and replace the cooler water, then repeat the process until all the liquids have been tested.
7. After all the results have been tested look through the table and compare the predicted pH to the actual pH, then make a graph and write your conclusion.

\*It is advised to test waters first (salt water, tap water, cooler water) and liquids such as lime juice, Disiclin and Cola last as they may affect other readings.

**Data Table**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Solution | Predicted pH | | | | Actual pH | | | Average Predicted pH (1 d.p) | Average Actual pH (1 d.p) |
| Cola | 2.3 | | 2 | 3 | 2.3 | 2.576 | 2.6 | 2.4 | 2.5 |
| Disiclin | 14 | | 9 | 8 | 4.9 | 5.373 | 5.64 | 10.3 | 5.3 |
| Lime Juice | 3 | | 3 | 2 | 2.2 | 2.385 | 2.41 | 2.7 | 2.3 |
| Tap Water | 7.5 | | 6 | 4 | 6.9 | 7.232 | 7.18 | 5.8 | 7.1 |
| Cooler Water | 7 | | 7 | 7 | 6.49 | 6.567 | 8.62 | 7 | 7.2 |
| Vinegar | 3.5 | | 3 | 2 | 2.2 | 2.463 | 2.4 | 2.8 | 2.4 |
| Salt Water | 6.5 | | 6 | 8.5 | 6.52 | 6.842 | 6.9 | 7 | 6.8 |
| 50% Alcohol | 5.5 | 13 | 2 | 10 | 7.89 | 8.233 | 4.65 | 7.6 | 6.9 |
| Pure Alcohol | 4 | 14 | 1 | 13 | 6.35 | 7 | 8.65 | 8 | 7.3 |

**Results (graphed)**

**Conclusion/Evaluation**

I think overall the predicted pH’s where quite close to the actual pH apart from the predictions for the two alcohols and the disiclin. Most of the groups thought that disiclin would be more of a base when in fact it turned out to be an acid; and the alcohols were thought o be either bases or acids but turned out to be quite close to 7 (the neutral). Another observation which is quite interesting to note is the difference in pH readings for the 50% alcohol. In all the other data the differences between the pH’s is usually off by one or two but in this case the pH readings were 7.89, 8.233 and 4.65 which is a bit strange because it was the same substance being tested but it gave two similar readings and one that was completely different. I think in the future if this lab were to be repeated a hypothesis should be created and the pH of the substances could be tested under various conditions to see if something like temperature could affect it or if the amount of time the sensor is in the beaker changes the pH.